

## **Part 1            General**

### **1.1                REFERENCES**

- .1        CSA Group
  - .1        CSA C22.2 No.206], Lighting Poles.

### **1.2                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Submit required documents and samples.
- .2        Product Data:
  - .1        Submit manufacturer's instructions, printed product literature and data sheets for traffic lights and include product characteristics, performance criteria, physical size, finish and limitations.

### **1.3                DELIVERY, STORAGE AND HANDLING**

- .1        Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2        Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3        Storage and Handling Requirements:
  - .1        Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2        Store and protect from nicks, scratches, and blemishes.
  - .3        Replace defective or damaged materials with new.

## **Part 2            Products**

### **2.1                SOLAR TRAFFIC LIGHTS**

- .1        General
  - .1        Operation: red-green traffic lights to manage traffic on two (2) lanes. The direction of flow on these two (2) lanes is managed by red-green traffic lights at each end of the tracks. The traffic flow may be stopped or reversed depending on the needs.
  - .2        Activation mode: Manual with handle. Toggle switch towards direction 1 or direction 2.  
  
Traffic lights A-1 and A-2 manage the flow of the north track. Traffic lights B-1 and B-2 manage the flow of the south track.  
  
In "normal" mode, the lights are:  
A-1: Red  
A-2: Green

B-1: Green  
B-2: Red

In the "out of the ferry" mode, the lights are:

A-1: Red  
A-2: Green  
B-1: Red  
B-2: Green

In "to the ferry," the lights are:

A-1: Green  
A-2: Red  
B-1: Green  
B-2: Red

During a change of state causing the reversal of traffic in a way, a period of transition with the red lights at each end must be programmed into the controller.

Moreover, this mode is to be blocked in the system because it would effectively get two-way traffic contrary to the standard used in North America:

A-1: Green  
A-2: Red  
B-1: Red  
B-2: Green

This mode must be disabled for selection by the operator.

Finally, in "off" mode, when the system is not used, it should be possible to turn off all the lights.

- .3 Controller: programmable controller for multiple configurations signaling.
- .4 Controller positioning: inside the post.

## .2 Solar panel

- .1 Minimum total power (Vmp): 100 watts.
- .2 Protection against snow accumulation.
- .3 Section (s) replaceable (s).

## .3 Batteries

- .1 Battery Type: LiFePO4 (lithium iron phosphate), minimum 180 Ah.
- .2 Total capacity (watts): 864 watts minimum at -25°C.
- .3 Operating Temperature: High minimum: 60°C / Low minimum: - 35°C.
- .4 Location of batteries: Inside the post.

- .5 Compliant to RoHS directive. This concerns the restriction of use of certain hazardous substances in electrical and electronic equipment.
- .6 Recharging time (full power): maximum 10 hours.
- .7 Battery life: minimum 6 days.
- .4 Communications
  - .1 Wireless 802.15.14 covering a distance of 1.6 km for synchronization point to multipoint.
  - .2 The protocol of wireless communication must not interfere with existing wireless communications on the site of the port of Cap-aux-Meules.
- .5 Light
  - .1 LEDs as light sources in a housing with solar shading.
    - .1 Red: 625 nm.
    - .2 Green: 500 nm.
  - .2 Dimensions: 200 mm diameter each.
  - .3 Bright center: minimum luminance of 4000 cd / m<sup>2</sup>.
  - .4 Supports and mounting accessories in stainless steel.
- .6 Aluminum pole
  - .1 Aluminum pole for insertion of batteries and controller inside and having the following characteristics:
    - .1 Mounting on concrete base.
    - .2 Type of poles: one piece of square section aluminum alloy with a minimum height of 6096 mm, minimum square section of 152 mm, minimum thickness 0.188 GA.
    - .3 Anchor bolts with galvanized steel shims, nuts and caps.
    - .4 Colour: black.
    - .5 Openings planned according to the needs of the installed equipment.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for roadway lighting installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative .
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### **3.2 INSTALLATION**

- .1 Install poles true and plumb, complete with brackets in accordance with manufacturer's instructions.
- .2 Install traffic lights, solar panels and accessories on the poles.
- .3 Check the orientation, height and inclination of traffic lights and solar panels.
- .4 Make the necessary connections between the elements.
- .5 Perform tests required.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse, recycling.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
  - .2 Do not dispose of preservative treated wood through incineration.
  - .3 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
  - .4 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Departmental.
  - .5 Dispose of unused wood preservative material at official hazardous material collections site approved by Departmental Representative.
  - .6 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in any other location where they will pose health or environmental hazard.
  - .7 Divert unused concrete materials from landfill to local quarry approved by Departmental Representative.

**END OF SECTION**